By a special correspondent

The UK was providing unmanned aerial systems that were 'absolutely state of the art', the Defence Select Committee was told today.

As part of its inquiry into Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), the Committee took evidence from the following witnesses:
- John Howe, Thales UK
- Victor Chaves, Vice-President, Thales UK
- Chris Day, Thales UK
- Nick Miller, Thales UK

Chairman of the Committee James Arbuthnot began by asking how important unmanned aerial vehicles (UAVs) and unmanned aerial systems were to Thales' business, how important the technology was and how it was likely to develop.

Responding, Mr Howe stated that Thales were a prime contractor, a systems integrator and a provider of high technology equipment. With ISTAR, Thales was strongly focused on provision of UAVs and was a prime contractor for the UK's Watchkeeper programme, providing ISTAR capability for the future for the UK's armed forces.

Mr Chavez stressed the importance of Thales with regard to ISTAR and noted that it was a major element of much of the company's work, as opposed to other companies who may have an ISTAR division. Thales was not merely a platform provider, but instead could provide more specialised systems elements with regard to C4 ISTAR.

Mr Arbuthnot asked whether the inquiry should be focused more closely on platforms as opposed to UAV's specifically. Responding, Mr Chavez felt it was important to consider the platforms dimension. It was also important to differentiate systems where the platform presented the highest risk element to systems, as opposed to ISTAR, where the platform was essentially a low-risk element whereas the major risk lay in the maturation of sensor technology. Platforms had an important role to play, he agreed, but platform complexity could be far greater in some instances.

Mr Arbuthnot noted that two of the three key technological aspects were bought from the US and asked whether the UK and Europe was lagging behind.

There were distinct layers to the UAV programme, Mr Chavez suggested, and the US had invested far more in strategic systems. In the 'middle level' including Watchkeeper and related programmes, Israel had invested the most money, and Israeli originated designs formed much of other country's work, whereas in smaller, more portable UAV's, interesting designs could be provided 'almost out of people's back gardens'. That said, there remained strong usage by

Israel and the US. With regard to the UK, programmes like Watchkeeper were 'absolutely state of the art', he declared. The system was originally on the basis of an Israeli design, but the system design within this was taken from best in class across the world and there were a wide range of systems issues. The UK's thinking on systems was very advanced, he added.

Mr Howe stated that the vehicle for Watchkeeper, though derived from an Israeli product, was being developed in the UK with a Thales contractor.

Right at the outset of Watchkeeper, the MoD had placed very stringent rules on sustainability of supply, Mr Chavez added, in order to ensure that intellectual property remained in the UK, and this explained the joint venture that had taken place.

Mr Day agreed that the work of Thales with Hermes had put the UK in an excellent position.

Moving on and asked about the feedback of the work of this technology in theatres, Mr Miller explained that technology was operating over thousands of hours. Targets had been very tough since engaging in this work with the MoD and logistic support had been vastly improved upon in this time. Vehicles were being used for up to 100 hours consistently and it was necessary to support this usage as operations evolved, in order that the system, including Watchkeeper, could adapt to provide more effective help. Thales had started to learn very significant lessons from current operations, and was talking to the military and to those in the field in order that issues could be addressed quickly.Thales worked with the regiments on Salisbury Plain and acted quickly to ensure changes on the ground.

Mr Day highlighted the video capabilities of Thales vehicles and asserted that these were providing battle-winning capability. In each theatre there was five aircraft, with two ready to go at all time. He agreed that one airframe could be used more regularly than others, but assured that very detailed logs were taken of this to keep a hold of how much the separate components were being used. Most UAV systems would be incapable of working above 50 degree temperatures, which the systems had had to deal with since arriving in Iraq. There was also a problem of working in extreme cold, or in incredibly dusty climates were systems had to be cleaned twice a day, and people had to be able to plan and operate in incredibly windy environments. Watchkeeper had been created to deal with exactly such concerns.

Mr Day stated that platforms were not generally moved from one theatre to another, but that logs were taken and that information about the system as it was used in both theatres was closely considered.

Moving on, the panel were asked about the possible future benefits of development of Hermes 450.

Hermes 450 was a collection of intelligence and the next step forward would be to ensure that such information could be passed to all necessary players in the field. The ground element of Watchkeeper was vital given the two distinct roles of the two systems.

Asked the differing roles of such technology in Iraq and Afghanistan, Mr Miller agreed that the

role in Iraq was largely one of providing intelligence, whereas in Afghanistan use was different and more varied. There was a similar role to that in Iraq but an additional support role when the military entered complex or difficult situations. The Hermes 450 system could provide a crucial birds-eye view of trouble spots and information could be provided near enough in real time.

The most significant value was provided to those in actual contact, who essentially had a handheld TV screen providing a view of what was being shown by the Hermes 450 cameras above them.

Pressed for further clarification and assurances that such model aircraft platforms could provide a full video-stream or infra-red clarity, and why each specific system was so important, Mr Miller stated that there were two air vehicle platforms that could be used in operations.

There was a lot of activity on the ground where people wanted to know what was immediately ahead of them, and mini-UAV's provided the ability for this within around 25 seconds. Operations in urban environments required mini-UAVs, as these were small enough to remain useful. Mini-UAVs could provide a thermal sensor or a TV sensor, but not both, and so the use of these was largely dependant on the time of day.

The driver for moving between smaller and larger systems as operations became more complex was the need for clarity in images. Bigger platforms could also carry other sensors, including radars which provided an image akin to that viewed on TV. However, such images could penetrate through cloud and continue to provide clear images on the ground. Such radars weighed about 40kg as a minimum, and putting these in the air required larger platforms. As a result, the critical issue was that the extent of a payload, and he reasoned that the payload should be around 10-20 per cent of the overall mass of a platform.

US technology sought to fly higher, but imagery was less good, and so more significant sensors were required. Flying higher ensured that systems could be kept safe. It was sometimes necessary, in operations, to watch a specific place for up to 24 hours per day and to do so undetected, and this was not possible with a mini-UAV. Hermes 450 and Watchkeeper were being developed to ensure that buildings could be watched persistently.
Moving on, the panel were asked whether there was a conflict in Afghanistan between those on the ground and high commanders, as a result of the use of such technology.

Responding, Mr Miller stated that MoD had structured UAVs specifically in such a way. Commanders provided assets for specific activities and would be dedicated for an entire operation, meaning there would be no conflict with higher commanders. If a higher priority issue arose, it was possible that commanders in the field could default to mini-UAVs and suffer the poorer image quality, he stated. Given the development of Watchkeeper, the panel were asked whether there was any scope for integration of systems.

Mr Miller noted that UAVs had been around for some time and that Thales had a good grasp of these. The question was how to integrate Watchkeeper into comms and other aspects of defence technology. Thales was working with MoD to ensure very specific viewing of areas on the ground through use of Bowman radios.

Given the likelihood of more sophisticated enemies in the future, the panel were asked what was being done now to ensure that systems could be transferred to other countries. Watchkeeper was created on the basis of being around for the next 30 years. Data links were encrypted, inhibiting some of the problems that could arise elsewhere, and the noise of the system was carefully considered in order that this was obfuscated or silenced. It was important to understand the need to continue evolving, and Thales' significant knowledge base across the field was of great benefit.

David Hamilton asked what else Watchkeeper could do that was better than Hermes 450. Mr Day cited advancements in the air vehicle itself and the network-ground infrastructure. The vehicle itself could take EO and IR radar at the same time and had enhanced structural integrity, with improved access to sub-systems and improved avionics.

On the ground infrastructure, there were dual data links and the ability to pass information securely around the battle-space. Watchkeeper had to provide a worldwide capability and needed to be flexible for operations in the future.

Mr Hamilton noted the MoDs hope that the inservice date would be in early 2010, and the panel expressed confidence that this could be reached. Critical design reviews had taken place and all milestones had been met, with the first flight in April 2008, and 2010 should be reached as planned.

It was surely likely that enemy military groups would have similar capabilities in the near future, and the panel were asked whether any counter-measures were being used.
Mr Chavez noted the need for enhanced air defence systems and assured that Thales was working in this area at present. UAVs were very difficult targets and were hard to see on radars, meaning that missile systems struggled to hit them, so improvement of air defence systems represented a natural way to proceed.

An advantage of Watchkeeper was that the sensor was being steered, as opposed to a plane being manually flown, and he assured that there was a lot of automation in Thales' work. Asked whether discussions with the Civil Aviation Authority with regard to trials were proceeding well, Mr Howe stated that this was a discussion that the MoD was leading on. Changing airspace arrangements was quite elaborate and the CAA were making progress on this. This was a significant issue but he rejected suggestions that this was a 'significant clog' in progress.

Mr Day added that there was an existing possibility to fly in temporary airspace that was irrespective of future changes.

Responding to a question from Mr Hamilton on whether the Hermes system could be upgraded independently of Israeli innovation, Mr Chavez and Mr Howe assured that this would be the case.

The panel were asked why the UK did not adopt a process similar to that of the global hawk in the US, Mr Chavez stated that these were very different classes of UAV. There was a

competition, with offers made by Lockheed Martin, Northrop Grumman and BAE and the decision had been made to accept the Thales proposal.

Asked about the possibility of weaponising these vehicles and whether this was possible, Mr Howe asserted that this was an issue for the MoD and not Thales, who were contracted only to provide an information system. This was a question of military requirement.

The MoD had acknowledged shortfalls in dissemination processes of ISTAR, the panel were told, and it was asked whether the Watchkeeper structure could address such shortfalls.
Mr Chavez, in responding, stated that Hermes 450 was akin to having a satellite TV feed coming into the home, which could be watched on screen, whereas Watchkeeper was valuable for taking streams of data and logging it into databases, in order that data could be retrieved easily.

Anyone on the battlefield could retrieve such information and this was amongst the reasons why Watchkeeper would allow for a huge increase in response to commander's request for intelligence. A great deal of data was stored at present but it was not easily accessible, and Watchkeeper's system would provide for substantial improvement to this.
The MoD had quite a lot of collectors of information at present but had not provided the best way to disseminate this.

Moving on and in response to a question from Adam Holloway, Mr Chavez stated that there was nothing to stop Hermes 450 being used as a 'jamming system' to disrupt the communications of others. On mining of data, he assured that Watchkeeper would come with a number of tools to aid this.

Asked whether the automatic system was set to improve intelligence and decision-making procedures, Mr Miller stated that the sole purpose of UAVs was to collect imagery and to put sensors at the correct point on the ground. Automation of this was a central purpose of Thales new innovations, with a focus on specific radar points.

In addition, systems could essentially survey an entire area and provide a safest path for progress, and such innovative tools could be of great use, he felt.

Mr Arbuthnot asked about manning of systems and whether there had to be a broad mix of technologies in order to provide greatest benefit. Mr Miller agreed entirely. Referring to payloads, and the complex suites of technology, he agreed that manning was necessary for many of these to be most effective.

The fragility of GPS was very clear at the beginning of the 'Watchkeeper journey' ten years ago, Mr Miller assured, and great consideration had been made of how to future proof Watchkeeper. Instruments were on board for accurate positioning and there were ways of getting around this fragility, he assured.